

## CLAIMS

- 5           1.       A method for transmitting a WDM signal:
- modulating a first optical signal on a first wavelength with a first data signal  
              having a first data rate to generate a first modulated optical signal having a first  
              bandwidth;
- modulating a second optical signal on a second wavelength with a second data  
10       signal having a second data rate to generate a second modulated optical signal having a  
              second bandwidth, said second bandwidth being greater than said first bandwidth and  
              said WDM signal comprising said first modulated optical signal and said second  
              modulated optical signal; and
- applying error correction coding to said second data signal so that said second  
15       data signal experiences a greater coding gain than said first data signal.
2.       The method of claim 1 wherein said error correction coding comprises  
              Reed-Solomon coding.
- 20           3.       The method of claim 2 wherein said Reed-Solomon coding comprises  
              coding in accordance with the G.975 standard.
4.       The method of claim 2 wherein said Reed-Solomon coding comprises  
              coding in accordance with the G.709 standard.

5. The method of claim 1 wherein said first data signal comprises an OC-48 signal and said second data signal comprises an OC-192 signal.

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6. The method of claim 1 further comprising:  
multiplexing said first modulated optical signal and said second modulated optical signal together to form said WDM signal.

7. The method of claim 1 wherein said first modulated optical signal and said second modulated optical signal have substantially similar power levels when multiplexed together.

8. The method of claim 1 wherein no error correction coding is applied to said first data signal.

9. A method of receiving a WDM signal, said method comprising:  
demodulating a first modulated optical signal derived from said WDM signal to form a first recovered data signal, said first modulated optical signal having a first bandwidth;

demodulating a second modulated optical signal derived from said WDM signal to form a second recovered data signal, said second modulated optical signal having a second bandwidth greater than said first bandwidth; and

decoding said second recovered data signal in accordance with an error correction coding scheme wherein said error correction coding scheme of said second recovered data signal compensates for a lower signal to noise ratio of said second modulated optical signal relative to said first modulated optical signal.

10. The method of claim 9 wherein said error correction coding scheme comprises a Reed-Solomon encoding scheme.

11. The method of claim 10 wherein said Reed-Solomon coding scheme comprises a G.975 encoding scheme.

12. The method of claim 10 wherein said Reed-Solomon coding scheme comprises a G.709 coding scheme.

13. The method of claim 9 wherein said first recovered data signal comprises an OC-48 signal and said second recovered data signal comprises an OC-192 signal.

14. The method of claim 9 wherein said first modulated optical signal and said second modulated optical signal are received with substantially similar power levels.

15. The method of claim 9 wherein said first recovered data signal is not encoded for error correction.

16. A WDM transmission system comprising:

a first transmitter generating a first modulated optical signal that has been modulated with a first data signal;

5 a second transmitter generating a second modulated optical signal that has been modulated with a second data signal; and

an error correction coding block that applies an error correcting code to said second data signal prior to modulation so that a coding gain of said second modulated optical signal is greater than any coding gain of said first modulated optical signal.

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17. The WDM transmission system of claim 16 wherein said first data signal experiences no error correction coding.

18. The WDM transmission system of claim 16 wherein said error correcting code comprises a Reed-Solomon code.

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19. The WDM transmission system of claim 16 wherein said error correction coding block operates in accordance with standard G.975.

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20. The WDM transmission system of claim 16 wherein a bandwidth of said second modulated optical signal is greater than a bandwidth of said first modulated optical signal.

21. The WDM transmission system of claim 16 further comprising:

a first amplifier that amplifies said first modulated optical signal; and

a second amplifier that amplifies said second modulated optical signal, wherein

5 amplified power levels of said first modulated optical signal and said second modulated optical signals are substantially similar.

22. The WDM transmission system of claim 21 further comprising:

a multiplexer that combines said first modulated optical signal and said second

10 modulated optical signal to form a WDM signal.

23. The WDM transmission system of claim 21 wherein said first data signal

comprises an OC-48 signal and said second data signal comprises an OC-192 signal.

24. A WDM receiver system comprising:

15 a first optical receiver that recovers a first recovered data signal from a first modulated optical signal on a first wavelength;

a second optical receiver that recovers a second recovered data signal from a second modulated optical signal on a second wavelength; and

20 an error correction decoding block that decodes said second recovered data signal in accordance with an error correcting code imposed on data of said second recovered data signal, said error correcting code compensating for a lower signal to noise ratio of said second modulated optical signal.

25. The WDM receiver system of claim 24 wherein said first recovered data signal comprises an OC-48 signal and said second recovered data signal comprises an OC-192 signal.

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26. The WDM receiver system of claim 24 wherein said first recovered data signal has no error correcting code imposed on it.

27. The WDM receiver system of claim 24 wherein said second modulated optical signal has a greater bandwidth than said first modulated optical signal.

28. The WDM receiver system of claim 24 wherein said error correcting code comprises a Reed-Solomon code.

29. The WDM receiver system of claim 24 wherein said error correcting code is in accordance with standard G.975.

30. The WDM receiver system of claim 25 wherein said error correcting code is in accordance with standard G.709.

31. The WDM receiver system of claim 24 wherein said first modulated optical signal and said second modulated optical signals are received with substantially similar power levels.

32. Apparatus for transmitting a WDM signal:

means for modulating a first optical signal on a first wavelength with a first data signal having a first data rate to generate a first modulated optical signal having a first  
5 bandwidth;

means for modulating a second optical signal on a second wavelength with a second data signal having a second data rate to generate a second modulated optical signal having a second bandwidth, said second bandwidth being greater than said first bandwidth and said WDM signal comprising said first modulated optical signal and said  
10 second modulated optical signal; and

means for applying error correction coding to said second data signal so that said second data signal experiences a greater coding gain than said first data signal.

33. Apparatus for receiving a WDM signal, said method comprising:

means for demodulating a first modulated optical signal derived from said WDM  
15 signal to form a first recovered data signal, said first modulated optical signal having a first bandwidth;

means for demodulating a second modulated optical signal derived from said WDM signal to form a second recovered data signal, said second modulated optical  
20 signal having a second bandwidth greater than said first bandwidth; and

means for decoding said second recovered data signal in accordance with an error correction coding scheme wherein said error correction coding scheme of said second recovered data signal compensates for a lower signal to noise ratio of said second modulated optical signal relative to said first modulated optical signal.